REMARKS/ARGUMENTS

Claims 1-56 are currently pending in this application. Claims 1, 23, 35, 48, and 55 have been amended to make explicit that the claimed wireless base stations provides duplex communication, i.e. both uplink and down link communications as described in the specification. A number of other amendments have been made for stylistic and grammatical reasons without the intent to in any way limit the scope of the claims. No new matter has been introduced into the application by these amendments.

Double Patenting Rejection

Claims 1, 23, 35, 48 and 55 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 59, 71, 74, 75, and 83 of U.S. Patent Application No. 10/667,633. A Terminal Disclaimer has been filed in later filed Application No. 10/667633 (U.S. Publication No. 2004/0063430) with respect to this application. Accordingly, the withdrawal of the obviousness-type double patenting rejection for this case is respectfully requested.

Claim Rejections - 35 USC §103

Claims 1-7, 9-16, 19-20, 23-28, 30-32, and 35-56 stand rejected as being unpatentable over Budnik et al. in view of Scherzer in view of Sawaya with the rejection of numerous claims based on various subsidiary references. Claims 1, 8, 17-18, 21-23, 29, 33-35, 43, 46-49, and 53-56 also stand rejected as being unpatentable over Anderson et al. in view of Farwell in view of Budnik. These rejections are all traversed.

The present invention is directed to methods and apparatus to establish a duplex wireless communication between a mobile unit and a base station which is initiated by the transmission of an omnidirectional sounding pulse from the mobile unit and where the selected base station directs a beam toward the mobile unit. As explained in paragraph [0006], the wireless communication system comprises base stations equipped to both transmit and receive wireless communication signals between mobile units, and therefore by definition each possessing both a transmitter and receiver. Independent claims 1, 23, 35, 48 and 55 now explicitly require duplex communication between a base station and a mobile unit.

The communication system and claimed invention in Budnik is not analogous art. Budnik discloses a messaging system based on independent base transmitters and base receivers, as disclosed in Column 3, lines 12-16, such that the base transmitters and base receivers can be physically separated and of differing

quantities (see Column 3, lines 29-35). Budnik does not teach or suggest a wireless communication system for which the initiation of a bidirectional wireless communication between a mobile unit and a base station is required. All communication between Budnik's mobile units pass through the Budnik controller 112 which in essence defines a single super base station having a plurality of transmitters and receivers, not a plurality of base stations as defined in the present claims. Accordingly, there is no teaching or suggestion in Budnik of transmission of a sounding pulse by a mobile unit to initiate duplex communication with a base station equipped with a beamforming antenna which directs a beam toward the mobile unit.

Budnik further discloses base transmitters deciding independently whether to transmit the outbound message to a mobile unit in Column 9, lines 8-13. By Budnik's method for selecting communicating base stations, it is impossible to guarantee that exactly one base station communicates with a mobile unit because each base transmitter acts independently. On the contrary, Budnik discloses a system for simulcast communication such that a plurality of base transmitters simultaneously communicates with a mobile unit (see Column 1, lines 49-53). In the claimed invention, either a controller or the mobile unit selects one base station for bidirectional wireless communication with the mobile unit.

Applicants agree that Sawaya discloses a system where a controller selects a base station to communicate with the mobile station in Column 4, lines 8-11. However, it is not logical to use Sawaya's controller to select one base station in Budnik's simulcast communication system where it is desired that multiple base transmitters simultaneously transmit toward the mobile unit. Moreover, Sawaya's communication system is directed to methods whereby the base transmitters, not the mobile units, initiate communication between the base station and the mobile station as described in Column 3, lines 27-30. Accordingly, there is no teaching or suggestion in Budnik or Sawaya of a system whereby a sounding pulse is broadcast by a mobile unit to initiate duplex communication with a selected base station configured to direct a beam toward the mobile station.

Applicant agrees that Scherzer discloses that conventional wireless systems communicate information from a mobile unit to a base station broadcasting omnidirectionally. However, Sawaya adds nothing to Budnik or Scherzer in teaching or suggesting the features of the claimed invention as stated above.

Applicant also agrees that Menich discloses a system whereby a mobile station scans the common control channel identification signals transmitted from nearby base stations to selects a base station with the largest relative signal strength (see Column 1, lines 47-56). Menich does not teach or suggest a system by which a base station is selected by a controller based on the received signal strength

at the base stations of a sounding pulse broadcast by the mobile unit. Nor does Menich teach or suggest a system by which a base station is selected based on the received signal strength of the directed communication beams received by the mobile unit in response to the sounding pulse from the mobile unit. To enable the selection of a directional communication beam directed toward the mobile unit, it is necessary for the mobile unit to first transmit an omnidirectional sounding pulse so that the base stations can estimate the location of the mobile unit and direct the beam at the correct angle. Therefore, Budnik, Scherzer and Menich, alone or in combination, do not teach or suggest the features of the claimed invention for the reasons presented above.

With respect to the rejections based on Anderson, the Examiner analogizes the power control pulse discussed in Column 9 of Anderson with the claimed sounding pulse used to initiate communication with a base station. Anderson et al.'s "power control pulse" is a pulse periodically transmitted by each user station for power control after a connection has been established. Anderson et al. explains:

> Control Pulse
>
> A user station 102 in a cellular environment preferably has means for controlling transmission power to avoid interference with adjacent cells. ...
>
> The present invention achieves power control in one embodiment by use of a power control pulse transmitted periodically from each user station 102. **After establishment of a communication link**, described with regard to FIG. 3 herein, a control pulse time 213 and a third gap 214 may be reserved just prior to the start of the minor frame 202, in which the user station 102 transmits a control pulse 215. **The control pulse 215 provides to the base station 104 a power measurement of the air channel 203 indicative of the path transmission loss and link quality**. Each user station 102 generally transmits its control pulse 215 in the minor frame 202 allocated to it (e.g., seized by the user station 102).

> The control pulse 215 may be received by the base station 104 and **used by the base station 104 to determine information about the communication link it has with the user station** 102. For example, the base station 104 may determine, in response to the power, envelope, or phase of the control pulse 215, the direction or distance of the user station 104, and the degree of noise or multipath error to which the communication link with the user station 102 may be prone.
>
> In response to receiving the control pulse 215, the base station 104 determines the quality of the received signal including, for example, the received power from the power control pulse 215 and the signal-to-noise or interference ratio. The base station 104 then sends a message to inform the user station 102 to adjust its power if needed. Based on the quality of the received signal, the base station 104 may command the user station 102 to change (increase or decrease) its transmit power by some discrete amount (e.g, in minimum steps of 3 dB) relative to its current setting, until the quality of the control pulse 215 received by the base station 104 is above an acceptable threshold.
>
> Similarly, if the base station 104 knows the power setting of the user station 102, then the base station 104 can adjust its own power as well. **The base station 104 may adjust its power separately for each minor frame 202.**
>
> ...
>
> Information relating to the control pulse 215 for a particular user station 102 may be **transferred as information in control traffic from one base station 104 to another base station 104** in the case of a base station assisted handoff.

(Anderson et al. col. 8, ln. 61 to col. 10 ln.49; bold emphasis added.

The "power control pulse" is transmitted by each user at a periodic rate so fast that: **The base station 104 may adjust its power separately for each minor frame 202.** It is not a sounding pulse transmitted to establish wireless communications as claimed. The "power control pulse" transmitted by each user is overhead maintenance of an on-going communication with a particular base station. It is not a sounding pulse which is received by other base stations which in turn would then have to communicate "information related to the detected sounding pulse to the interface by each base station detecting the sounding pulse," as recited in claim 1. This would require each base station to process the reception of each control pulse in virtually every minor frame and be extremely wasteful of communication resources.

On page 27 of the Action, the Examiner asserts that Anderson "teaches a handoff method and suggests the idea of applying the method of handoff using the pulse signal (Col 10 Ln 46-49, Col. 15 and 16)." This is simply not the case; moreover, the present claims are directed to establishing a communication, not handover.

Anderson does not teach "communicating information related to the detected sounding pulse to the interface by each base station detecting the sounding pulse" as recited in claim 1, but col. 10, lns 46-49, teaches away from this claim limitation. The Anderson "power control pulse" is designed only for reception by the base station with which the user has a currently established link.

Anderson's power control pulse is used for a different function and is not similar to the sounding pulse used to establish communication between a mobile unit and a base station in the claimed invention. There is no teaching or suggestion in Anderson of a system whereby a sounding pulse is broadcast by a mobile unit to initiate duplex communication with a selected base station configured to direct a beam toward the mobile station.

The Examiner asserts that both Anderson and Farwell disclose methods and systems to handoff the existing wireless communication of a mobile unit from one base station to another (see Column 10, lines 46-49 in Anderson and Column 3, lines 37-45 in Farwell). This is irrelevant to the present claims which are directed

to initiating a wireless communication between a mobile unit and a base station. Therefore, Anderson and Farwell, alone or in combination, do not disclose or pertain to claims of the present invention.

Furthermore, as disclosed in Column 3, lines 36-40 of Farwell, Farwell teaches that the base station initiates hand off requests when the signal strength drops below a threshold. This is opposite to the present claims in which the mobile unit initiates communication through the transmission of a sounding pulse and the base stations which detect the sounding pulse then communicate to the system interface.

Finally, Anderson in view of Farwell further in view of Budnik does not teach or suggest the features of the claimed invention for the reasons presented above.

The prior art references simply do not disclose or suggest the broadcast of a sounding pulse by a mobile unit to initiate duplex communication with a base station such that the communicating base station is selected from a plurality of base stations to communicate using a directed beam.

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this

application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 1-56, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Cave et al.

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